

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 4/24/2020  
 FROM: Groundwater Section Jen Woody Reviewer's Name  
 SUBJECT: Application G- 18690 Supersedes review of 1/23/2019 Date of Review(s)

**PUBLIC INTEREST PRESUMPTION; GROUNDWATER**

**OAR 690-310-130 (1)** *The Department shall presume that a proposed groundwater use will ensure the preservation of the public welfare, safety and health as described in ORS 537.525. Department staff review groundwater applications under OAR 690-310-140 to determine whether the presumption is established. OAR 690-310-140 allows the proposed use be modified or conditioned to meet the presumption criteria. This review is based upon available information and agency policies in place at the time of evaluation.*

**A. GENERAL INFORMATION:** Applicant's Name: C & E Brentano Family LP County: Marion

A1. Applicant(s) seek(s) 9.7 cfs from 4 well(s) in the Willamette Basin,  
Middle Willamette/Champog subbasin

A2. Proposed use Irrigation(191 AF), Nursery (884 AF), Deficiencies in Rates (900 AF) Seasonality: \_\_\_\_\_

A3. Well and aquifer data (**attach and number logs for existing wells; mark proposed wells as such under logid**):

Well	Logid	Applicant's Well #	Proposed Aquifer*	Proposed Rate(cfs)	Location (T/R-S QQ-Q)	Location, metes and bounds, e.g. 2250' N, 1200' E fr NW cor S 36
1	MARI 1243	POA3	Alluvium	9.22	4S/2W-20 SW ¼ SE ¼	490' S, 2230' W fr NW cor Leard DLC 95
2	MARI 1337/1336	POA4	Alluvium	9.22	4S/2W-29 NW ¼ NE ¼	1840' S, 3270' E fr NW cor Servant DLC 94
3	MARI 1221	POA7	Alluvium	9.22	4S/2W-19 SE ¼ SE ¼	1070' N, 30' W fr NE cor Sauve DLC 62
4	MARI 1441	POA8	Alluvium	0.51	4S/3W-24 SW ¼ NW ¼	1060' N, 30' E fr W ¼ cor S 24
5	Proposed	POA9	Alluvium		4S/2W-29 NE ¼ NE ¼	350' S, 260' W fr NE cor S 29
6	Proposed	POA 10	Alluvium		4S/2W-29 SE ¼ NE ¼	1650' S, 900' W fr NE cor S 29

\* Alluvium, CRB, Bedrock

Well	Well Elev ft msl	First Water ft bls	SWL ft bls	SWL Date	Well Depth (ft)	Seal Interval (ft)	Casing Intervals (ft)	Liner Intervals (ft)	Perforations Or Screens (ft)	Well Yield (gpm)	Draw Down (ft)	Test Type
1	173	unk	20	4/27/1965	155	0-20	0-18	n/a	n/a	480	26	pump
2	170	unk	34	6/20/1967	159	0-20	0-158.5	n/a	118.5-158.5	1500	84	pump
3	172	unk	64	7/11/1968	172	0-20	0-174	n/a	104-164	1500	62	pump
4	114	unk	31	1/2/1976	203	0-62	0-205.5	n/a	106.5-188	unk	unk	unk
5	170	Unk	20*	*	160	0-18	0-160	n/a	100-160	Unk	Unk	Unk
6	170	unk	20*	*	160	0-18	0-160	n/a	100-160	Unk	Unk	unk

Use data from application for proposed wells.

A4. **Comments:** There are multiple uses and rates associates with each well, see Section C3b for details.  
\*POA 9 and POA 10 are not yet drilled. Water level is estimated to be similar to MARI 64822 based on similar location and aquifer materials.

A5.  **Provisions of the Willamette** \_\_\_\_\_ Basin rules relative to the development, classification and/or management of groundwater hydraulically connected to surface water  **are**, or  **are not**, activated by this application. (Not all basin rules contain such provisions.)  
 Comments: The wells will produce from a confined aquifer, therefore the pertinent rules (OAR 690-502-240) do not apply.

A6.  **Well(s) #** \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, tap(s) an aquifer limited by an administrative restriction.  
 Name of administrative area: \_\_\_\_\_  
 Comments: N/A

**B. GROUNDWATER AVAILABILITY CONSIDERATIONS, OAR 690-310-130, 400-010, 410-0070**

B1. **Based upon available data**, I have determined that groundwater\* for the proposed use:

- a.  is over appropriated,  is not over appropriated, or  cannot be determined to be over appropriated during any period of the proposed use. \* This finding is limited to the groundwater portion of the over-appropriation determination as prescribed in OAR 690-310-130;
- b.  will not or  will likely be available in the amounts requested without injury to prior water rights. \* This finding is limited to the groundwater portion of the injury determination as prescribed in OAR 690-310-130;
- c.  will not or  will likely to be available within the capacity of the groundwater resource; or
- d.  will, if properly conditioned, avoid injury to existing groundwater rights or to the groundwater resource:
- i.  The permit should contain condition #(s) 7n, Large Water Use Reporting;
  - ii.  The permit should be conditioned as indicated in item 2 below.
  - iii.  The permit should contain special condition(s) as indicated in item 3 below;

- B2. a.  **Condition** to allow groundwater production from no deeper than \_\_\_\_\_ ft. below land surface;
- b.  **Condition** to allow groundwater production from no shallower than \_\_\_\_\_ ft. below land surface;
- c.  **Condition** to allow groundwater production only from the alluvial groundwater reservoir ~~between approximately~~ \_\_\_\_\_ ft. and \_\_\_\_\_ ft. below land surface;
- d.  **Well reconstruction** is necessary to accomplish one or more of the above conditions. The problems that are likely to occur with this use and without reconstructing are cited below. Without reconstruction, I recommend withholding issuance of the permit until evidence of well reconstruction is filed with the Department and approved by the Groundwater Section.

**Describe injury** –as related to water availability– that is likely to occur without well reconstruction (interference w/ senior water rights, not within the capacity of the resource, etc): \_\_\_\_\_

B3. **Groundwater availability remarks:** \_\_\_\_\_

The proposed wells are located on a terrace about 70 feet above the floodplain of the Willamette River. The terrace is underlain by a thick sequence of fine-grained sediments that extends to depths of approximately 1000 feet. The bulk of the sediments are clays and silts that encase a few relatively thin beds of sand and gravel that do not appear to be continuous over widespread areas. The upper 80-100 feet of sediments are a sequence of graded beds of fine sand, silt, and clay (the Willamette Silt) deposited by a series of Pleistocene glacial floods which inundated the Willamette Valley. The water table occurs at shallow depths within the Willamette Silt, which acts as a leaky confining layer for productive sands and gravel at depth. Thin zones of sands and gravels are likely the primary water bearing units. The thin, discontinuous geometry and confined conditions suggest that the aquifer system could be vulnerable to long term drawdown and/or interference.

Proposed POA 10 is located approximately 400 feet from POA 1 associated with Permit G-17955. Additionally, there is a house located 500 feet from POA 10 that likely has an exempt well. Figure 5 shows there is potential for significant drawdown interference (~25-150 feet at 120 days of pumping) at POA 1 if POA 10 is installed at the proposed location. B1b is checked for this reason. The proposed location for POA 9 does not trigger this finding. If POA 10 is removed from this application, the injury finding in section B1b will be avoided.

Well yield in 4S/2W-19, 20, 29, 30 ranges from 20 to 1620 gpm, with a median yield of 100 gpm. The requested rates of up to 3.69 cfs (1656 gpm) for POA 8 and 9 may be possible as a combined rate of the proposed POAs.

Water level data from state observation well MARI 2331 indicates seasonal fluctuations of about 20 feet, but relatively stable conditions over the last 50 years (see hydrograph in Fig. 3). The thin, lenticular geometry of the water-bearing zones and the large proposed rate indicate that water-use reporting and water-level measurement conditions are recommended to protect other users.

**C. GROUNDWATER/SURFACE WATER CONSIDERATIONS, OAR 690-09-040**

C1. **690-09-040 (1):** Evaluation of aquifer confinement:

Well	Aquifer or Proposed Aquifer	Confined	Unconfined
1	Alluvial	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Alluvial	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	Alluvial	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Alluvial	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5	Alluvial	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6	Alluvial	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Basis for aquifer confinement evaluation:** Water-bearing sands and gravels in the area are overlain by 80 to 100 feet of saturated Willamette Silt. The water table occurs at depths of less than 50 feet within the silt unit, whereas water bearing zones are typically below 100 ft bld. The available data indicates the silt unit acts as a leaky confining unit for sands and gravels at depth.

C2. **690-09-040 (2) (3):** Evaluation of distance to, and hydraulic connection with, surface water sources. All wells located a horizontal distance less than ¼ mile from a surface water source that produce water from an unconfined aquifer shall be assumed to be hydraulically connected to the surface water source. Include in this table any streams located beyond one mile that are evaluated for PSI.

Well	SW #	Surface Water Name	GW Elev ft msl	SW Elev ft msl	Distance (ft)	Hydraulically Connected?			Potential for Subst. Interfer. Assumed?	
						YES	NO	ASSUMED	YES	NO
1	1	Mission Creek	130-140	130-140	3450	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	1	Mission Creek	130-140	130-140	4300	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	1	Mission Creek	130-140	130-140	1140	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	2	Horseshoe Lake	90-100	80-90	2450	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	3	Unnamed tributary to Willamette River	90-100	100	2630	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	1	Mission Creek	140-160	140-150	5350	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	4	Champoeg Creek	140-160	130-140	5800	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	1	Mission Creek	140-160	140-150	5800	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	4	Champoeg Creek	140-160	130-140	5300	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Basis for aquifer hydraulic connection evaluation:** Mission and Champoeg Creeks have headwaters in the terrace underlain by the Willamette Silt. As these stream drainages traverse the terrace toward the northeast, they progressively cut into the Willamette Silt until they intersect the water table, at which point they transition from ephemeral to perennial streams. This is consistent with published water level maps which indicate that groundwater in the alluvial aquifer system flows toward and discharges into the local stream network (Woodward and others, 1998). These facts indicate that the alluvial aquifer system is hydraulically connected to the local stream network. The depletion of local streams on the terrace by the proposed wells will be buffered, but not eliminated, by the low vertical hydraulic conductivity of the Willamette Silt and other clays and silts that lie above the deeper sands and gravels.

**Water Availability Basin the well(s) are located within:** Well #4 is in Watershed ID #182: WILLAMETTE R > COLUMBIA R - AB MOLALLA R; Wells 5 and 6 are in Watershed ID #30200708: Champoeg Creek > Willamette

C3a. **690-09-040 (4):** Evaluation of stream impacts for each well that has been determined or assumed to be **hydraulically connected and less than 1 mile** from a surface water source. Limit evaluation to instream rights and minimum stream flows that are pertinent to that surface water source, and not lower SW sources to which the stream under evaluation is tributary. Compare the requested rate against the 1% of 80% *natural* flow for the pertinent Water Availability Basin (WAB). If Q is not distributed by well, use full rate for each well. Any checked  box indicates the well is assumed to have the potential to cause PSI.

Well	SW #	Well < ¼ mile?	Qw > 5 cfs?	Instream Water Right ID	Instream Water Right Q (cfs)	Qw > 1% ISWR?	80% Natural Flow (cfs)	Qw > 1% of 80% Natural Flow?	Interference @ 30 days (%)	Potential for Subst. Interfer. Assumed?
1	1	<input type="checkbox"/>	<input type="checkbox"/>	none	n/a	<input type="checkbox"/>	1.00	<input checked="" type="checkbox"/>	<25%	<input checked="" type="checkbox"/>
2	1	<input type="checkbox"/>	<input type="checkbox"/>	none	n/a	<input type="checkbox"/>	1.00	<input checked="" type="checkbox"/>	<25%	<input checked="" type="checkbox"/>
3	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	none	n/a	<input type="checkbox"/>	1.00	<input checked="" type="checkbox"/>	<25%	<input checked="" type="checkbox"/>
4	2	<input type="checkbox"/>	<input type="checkbox"/>	n/a	n/a	<input type="checkbox"/>	3830	<input type="checkbox"/>	<25%	<input type="checkbox"/>
4	3	<input type="checkbox"/>	<input type="checkbox"/>	n/a	n/a	<input type="checkbox"/>	3830	<input type="checkbox"/>	<25%	<input type="checkbox"/>

C3b. **690-09-040 (4):** Evaluation of stream impacts by total appropriation for all wells determined or assumed to be **hydraulically connected and less than 1 mile** from a surface water source. **Complete only if Q is distributed among wells.** Otherwise same evaluation and limitations apply as in C3a above.

Well	SW #	Well < ¼ mile?	Qw > 5 cfs?	Instream Water Right ID	Instream Water Right Q (cfs)	Qw > 1% ISWR?	80% Natural Flow (cfs)	Qw > 1% of 80% Natural Flow?	Interference @ 30 days (%)	Potential for Subst. Interfer. Assumed?
1	1	<input type="checkbox"/>	<input type="checkbox"/>	none	n/a	<input type="checkbox"/>	1.00	<input checked="" type="checkbox"/>	---	<input checked="" type="checkbox"/>
2	1	<input type="checkbox"/>	<input type="checkbox"/>	none	n/a	<input type="checkbox"/>	1.00	<input checked="" type="checkbox"/>	---	<input checked="" type="checkbox"/>
3	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	none	n/a	<input type="checkbox"/>	1.00	<input checked="" type="checkbox"/>	---	<input checked="" type="checkbox"/>
4	2	<input type="checkbox"/>	<input type="checkbox"/>	n/a	n/a	<input type="checkbox"/>	3830	<input type="checkbox"/>		<input type="checkbox"/>
4	3	<input type="checkbox"/>	<input type="checkbox"/>	n/a	n/a	<input type="checkbox"/>	3830	<input type="checkbox"/>		<input type="checkbox"/>

**Comments:** The application has distributed rates for the four wells as follows:

- ~~Well 1/MARI 1243/POA3: 360 gpm irrigation, 3321 gpm nursery, 459 deficiency in rate~~
- ~~Well 2/MARI 1337/POA4: 360 gpm irrigation, 3321 gpm nursery, 459 deficiency in rate~~
- ~~Well 3/MARI 1221/POA7: 360 gpm irrigation, 3321 gpm nursery, 459 deficiency in rate~~
- Well 4/MARI 1441/POA8: 72 gpm irrigation, 158 gpm deficiency in rate . This well is also authorized under Certificate 53830 for Irrigation at 1.02 cfs. Therefore PSI is assessed at 688 gpm (1.53 cfs), but not triggered.
- POA 9/Well 5: 359 gpm irrigation, 1657 gpm nursery, 458 gpm deficiency in rate
- POA 10/Well 6 : 359 gpm irrigation, 1657 gpm nursery, 458 gpm deficiency in rate

POA 9/Well 5 and POA 10/Well 6 are located greater than one mile from Champoeg and Mission Creeks, and are therefore not affected by Section C3b.

C4a. **690-09-040 (5):** Estimated impacts on **hydraulically connected surface water sources greater than one mile** as a percentage of the proposed pumping rate. Limit evaluation to the effects that will occur up to one year after pumping begins. This table encompasses the considerations required by 09-040 (5)(a), (b), (c) and (d), which are not included on this form. Use additional sheets if calculated flows from more than one WAB are required.

Non-Distributed Wells													
Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
Distributed Wells													
Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													

		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
<hr/>													
(A) = Total Interf.													
(B) = 80 % Nat. Q													
(C) = 1 % Nat. Q													
<hr/>													
(D) = (A) > (C)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
(E) = (A / B) x 100		%	%	%	%	%	%	%	%	%	%	%	%

(A) = total interference as CFS; (B) = WAB calculated natural flow at 80% exceed. as CFS; (C) = 1% of calculated natural flow at 80% exceed. as CFS; (D) = highlight the checkmark for each month where (A) is greater than (C); (E) = total interference divided by 80% flow as percentage.

**Basis for impact evaluation:**

While the proposed wells will be hydraulically connected to Mission and Champoeg Creeks, stream depletion estimates are small enough to be within the margin of error associated with aquifer parameters. Therefore Section C4a does not trigger PSI.

C4b. **690-09-040 (5) (b) The potential to impair or detrimentally affect the public interest is to be determined by the Water Rights Section.**

C5.  **If properly conditioned**, the surface water source(s) can be adequately protected from interference, and/or groundwater use under this permit can be regulated if it is found to substantially interfere with surface water:  
 i.  The permit should contain condition #(s) \_\_\_\_\_;  
 ii.  The permit should contain special condition(s) as indicated in "Remarks" below;

C6. **SW / GW Remarks and Conditions:** The applicant's proposed wells would produce from an aquifer that has been found to be hydraulically connected to surface water, but they do not trigger a finding of PSI.

**References Used:**

Conlon, T.D., Wozniak, K.C., Woodcock, D., Herrera, N.B., Fisher, B.J., Morgan, D.S., Lee, K.K., and Hinkle, S.R., 2005. Ground-water hydrology of the Willamette Basin, Oregon: U.S. Geological Survey Scientific Investigations Report 2005-5168.

Hunt, B., 2003, Unsteady stream depletion when pumping from semiconfined aquifer: Journal of Hydrologic Engineering, January/February, 2003.

Iverson, J.I., 2002, Investigation of the hydraulic, physical, and chemical buffering capacity of Missoula Flood deposits for water quality and supply in the Willamette Valley of Oregon: Oregon State University, Unpublished Master's thesis, 147p.

OWRD water level and well log databases, includes reported water levels.

US Geological Survey Topographic Maps, St. Paul and Dayton Quadrangles.

Woodward, D.G., and others, 1998. Hydrogeologic Framework of the Willamette Lowland Aquifer System, Oregon and Washington. USGS Professional Paper 1424-B.

**D. WELL CONSTRUCTION, OAR 690-200**

D1. Well #: \_\_\_\_\_ Logid: n/a

D2. **THE WELL does not appear to meet current well construction standards based upon:**

- a.  review of the well log;
- b.  field inspection by \_\_\_\_\_;
- c.  report of CWRE \_\_\_\_\_;
- d.  other: (specify) \_\_\_\_\_

D3. **THE WELL construction deficiency or other comment is described as follows:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

D4.  **Route to the Well Construction and Compliance Section for a review of existing well construction.**

**Figure 1. Water Availability Tables**

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION  
 Water Availability as of 1/7/2020 for  
 CHAMPOEG CR > WILLAMETTE R - AT MOUTH

Watershed ID #: 30200708      Basin: WILLAMETTE      Exceedance Level: 80  
 Time: 12:00      Date: 01/07/2020

Month	Natural Stream Flow	CU + Stor Prior to 1/1/93	CU + Stor After 1/1/93	Expected Stream Flow	Reserved Stream Flow	Instream Water Rights	Net Water Available
1	37.30	8.64	0.00	28.66	0.00	0.00	28.66
2	51.70	8.16	0.00	43.54	0.00	0.00	43.54
3	22.40	5.11	0.00	17.29	0.00	0.00	17.29
4	10.90	3.96	0.00	6.94	0.00	0.00	6.94
5	6.15	6.11	0.00	0.04	0.00	0.00	0.04
6	3.04	7.88	0.00	-4.84	0.00	0.00	-4.84
7	2.94	12.32	0.00	-9.38	0.00	0.00	-9.38
8	1.88	9.99	0.00	-8.11	0.00	0.00	-8.11
9	1.08	5.42	0.00	-4.34	0.00	0.00	-4.34
10	1.00	1.37	0.00	-0.37	0.00	0.00	-0.37
11	10.10	5.79	0.00	4.31	0.00	0.00	4.31
12	47.80	11.51	0.00	36.29	0.00	0.00	36.29
Stor	28100	5220	0	22880	0	0	22880

## Water Availability Analysis Detailed Reports

### WILLAMETTE R > COLUMBIA R - AB MOLALLA R WILLAMETTE BASIN

Water Availability as of 4/22/2020

Watershed ID #: 182 [\(Map\)](#)

Exceedance Level: 80%

Date: 4/22/2020

Time: 1:28 PM

## Water Availability Calculation

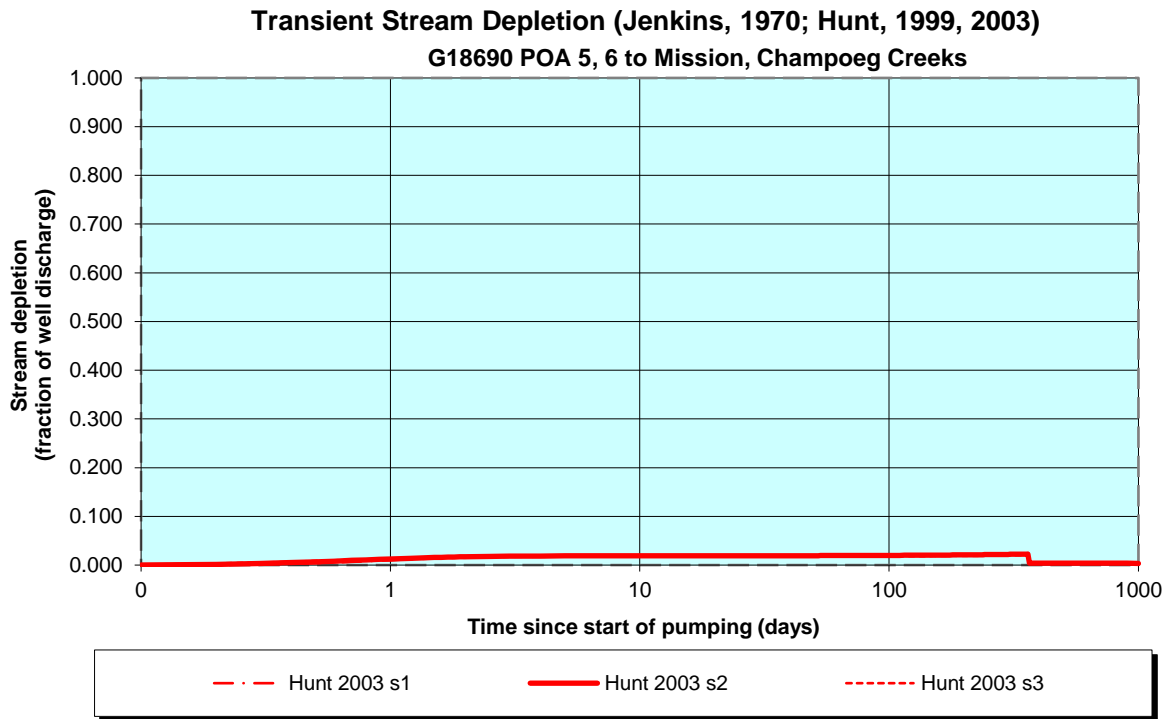
Monthly Streamflow in Cubic Feet per Second  
Annual Volume at 50% Exceedance in Acre-Feet

Month	Natural Stream Flow	Consumptive Uses and Storages	Expected Stream Flow	Reserved Stream Flow	Instream Flow Requirement	Net Water Available
JAN	21,400.00	2,300.00	19,100.00	0.00	1,500.00	17,600.00
FEB	23,200.00	7,480.00	15,700.00	0.00	1,500.00	14,200.00
MAR	22,400.00	7,260.00	15,100.00	0.00	1,500.00	13,600.00
APR	19,900.00	6,920.00	13,000.00	0.00	1,500.00	11,500.00
MAY	16,600.00	4,260.00	12,300.00	0.00	1,500.00	10,800.00
JUN	8,740.00	1,980.00	6,760.00	0.00	1,500.00	5,260.00
JUL	4,980.00	1,810.00	3,170.00	0.00	1,500.00	1,670.00
AUG	3,830.00	1,650.00	2,180.00	0.00	1,500.00	680.00
SEP	3,890.00	1,390.00	2,500.00	0.00	1,500.00	995.00
OCT	4,850.00	757.00	4,090.00	0.00	1,500.00	2,590.00
NOV	10,200.00	890.00	9,310.00	0.00	1,500.00	7,810.00
DEC	19,300.00	973.00	18,300.00	0.00	1,500.00	16,800.00
ANN	15,200,000.00	2,250,000.00	13,000,000.00	0.00	1,090,000.00	11,900,000.00





**Figure 3. Stream depletion POAs 5 and 6, Mission and Champoeg Creeks, using conservatively long pumping duration. Stream depletion estimates are smaller than the margin of error associated with aquifer parameter estimation, so PSI is not triggered per Section C4a.**



Output for Stream Depletion, Scenario 2 (s2):					Time pump on (pumping duration) = 360 days							
Days	30	60	90	120	150	180	210	240	270	300	330	360
H SD 2003	1.92%	1.95%	1.98%	2.01%	2.04%	2.07%	2.11%	2.14%	2.17%	2.20%	2.23%	2.26%
Qw, cfs	3.692	3.692	3.692	3.692	3.692	3.692	3.692	3.692	3.692	3.692	3.692	3.692
H SD 99, cfs	0.928	1.250	1.457	1.610	1.730	1.829	1.913	1.985	2.048	2.104	2.154	2.200
H SD 03, cfs	0.071	0.072	0.073	0.074	0.075	0.077	0.078	0.079	0.080	0.081	0.082	0.084
<b>Parameters:</b>					<b>Scenario 1</b>	<b>Scenario 2</b>	<b>Scenario 3</b>	<b>Units</b>				
Net steady pumping rate of well	Qw	1657.00		1657.00		1657.00		gpm				
Time pump on (pumping duration)	tpon	360		360		360		days				
Perpendicular from well to stream	a	5300		5500		5800		ft				
Well depth	d	160		160		160		ft				
Aquifer hydraulic conductivity	K	10		20		50		ft/day				
Aquifer saturated thickness	b	140		140		140		ft				
Aquifer transmissivity	T	1400		2800		7000		ft*ft/day				
Aquifer storativity or specific yield	S	0.0001		0.0001		0.0001						
Aquitard vertical hydraulic conductivity	Kva	0.01		0.01		0.01		ft/day				
Aquitard saturated thickness	ba	90		90		90		ft				
Aquitard thickness below stream	babs	3		3		3		ft				
Aquitard porosity	n	0.2		0.2		0.2						
Stream width	ws	20		20		20		ft				

Figure 4. Water-Level Trends in Nearby Wells

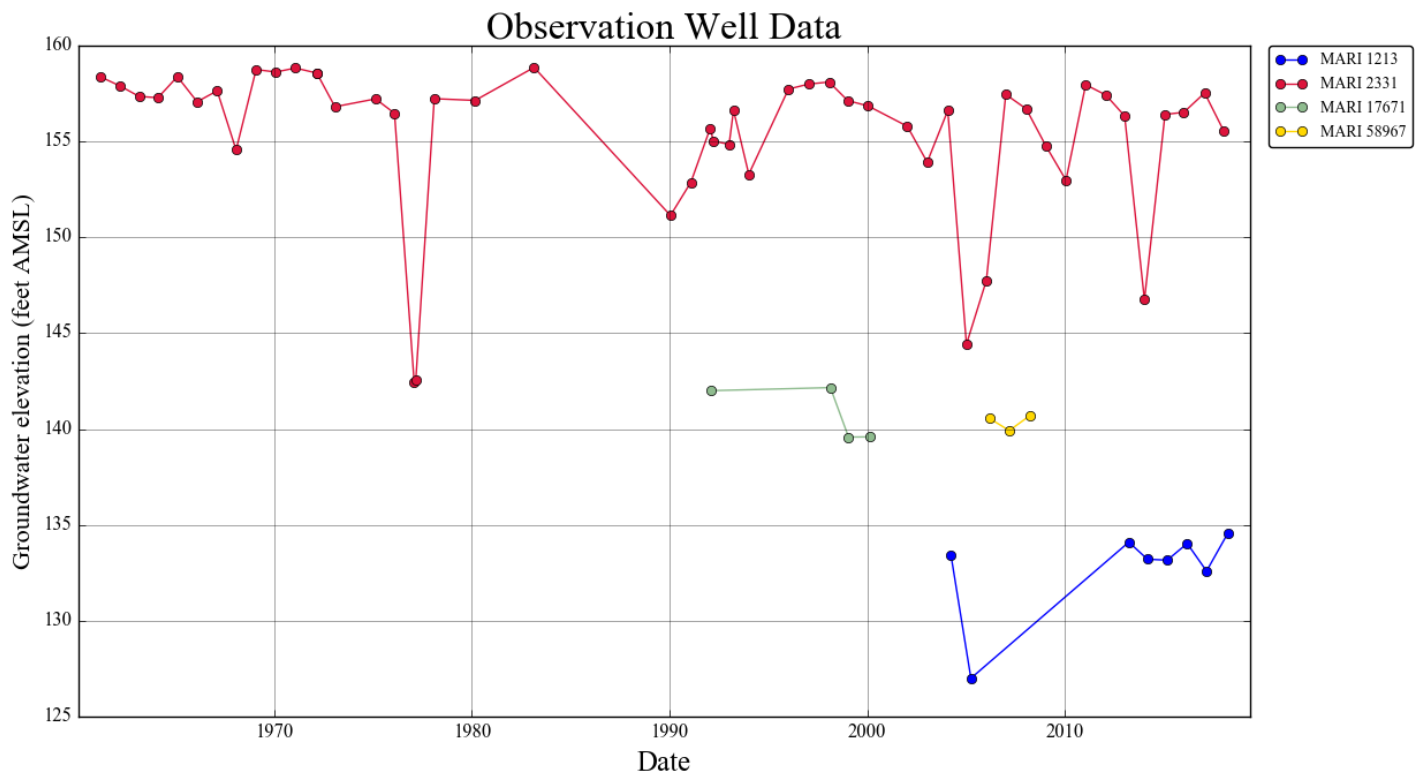
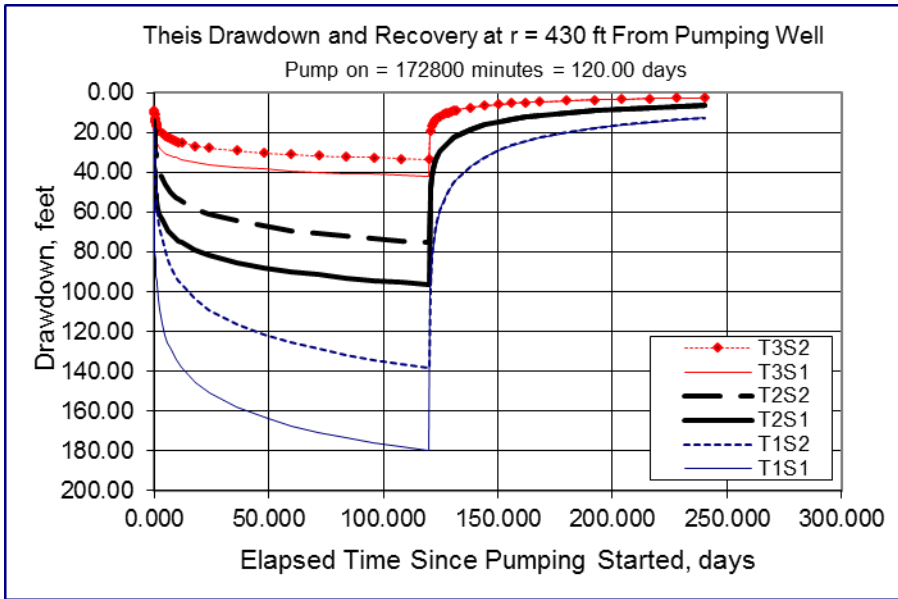


Figure 5. Distance-drawdown estimates for POA 10 to POA 1 on Permit G-17955 indicate the potential for injury to nearby wells. This estimate uses the highest proposed rate: 1657 gpm nursery use from Nov 1- Feb 28/29.



Input Data:	Var Name	Scenario 1	Scenario 2	Scenario 3	Units	
Total pumping time	t		120		d	
Radial distance from pumped well:	r		430.00		ft	<b>Q conversions</b>
Pumping rate	Q		1657.0		gpm	1,657.00 gpm
Hydraulic conductivity	K	10	20	50	ft/day	3.69 cfs
Aquifer thickness	b		140		ft	221.52 cfm
Storativity	S_1		0.00010			318,994.65 cfd
	S_2		0.00100			7.32 af/d
<b>Transmissivity Conversions</b>	T_f2pd	1,400	2,800	7,000	ft <sup>2</sup> /day	
	T_ft2pm	0.9722	1.9444	4.8611	ft <sup>2</sup> /min	
	T_gpdft	10,472	20,944	52,360	gpd/ft	